

Motor vehicle assembling machine**BEST AVAILABLE COPY**

Patent number: GB2208820
Publication date: 1989-04-19
Inventor: MARIANNE JEAN-JACQUES; GUILLAS GEORGES
Applicant: SCIaky IND S A (FR)
Classification:
- **international:** B23K31/00
- **european:** B23K37/047; B23Q3/157; B62D65/02
Application number: GB19880019513 19880817
Priority number(s): FR19870011718 19870819

Also published as:

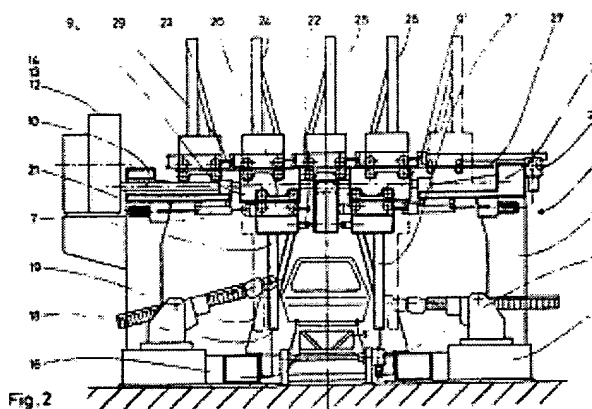
FR2619523 (A1)
DE3828267 (A1)

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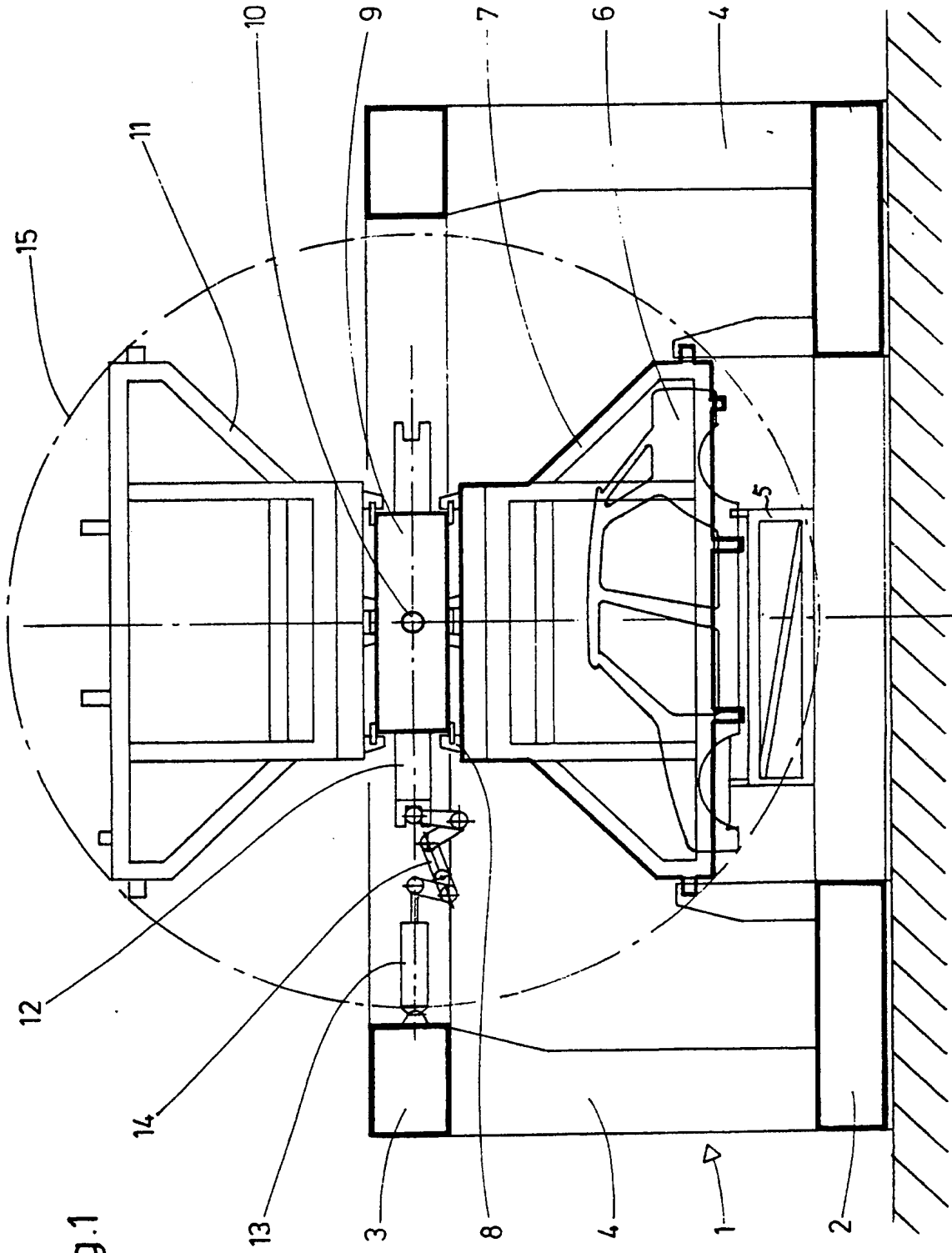
Abstract not available for GB2208820

Abstract of corresponding document: **DE3828267**

A machine for assembling motor vehicle or similar bodies has storage means (27) for tools (7, 7 min, 23, 24, 25, 26) relating to various models of bodywork. At least one support (9) pivotally mounted on a pivot (10) is adapted, in angularly offset positions, to receive at least two tools for two different models of body. Operating means (12, 13, 14) pivot the support (9) and place one of the tools in the working position while the other moves into a standby position. In the standby position of the support (9) means (8, Fig 1 (not shown) 27, 28) provide for movement towards the support of one of the tools situated on the storage means while the tool situated on the support is moved towards the storage means.



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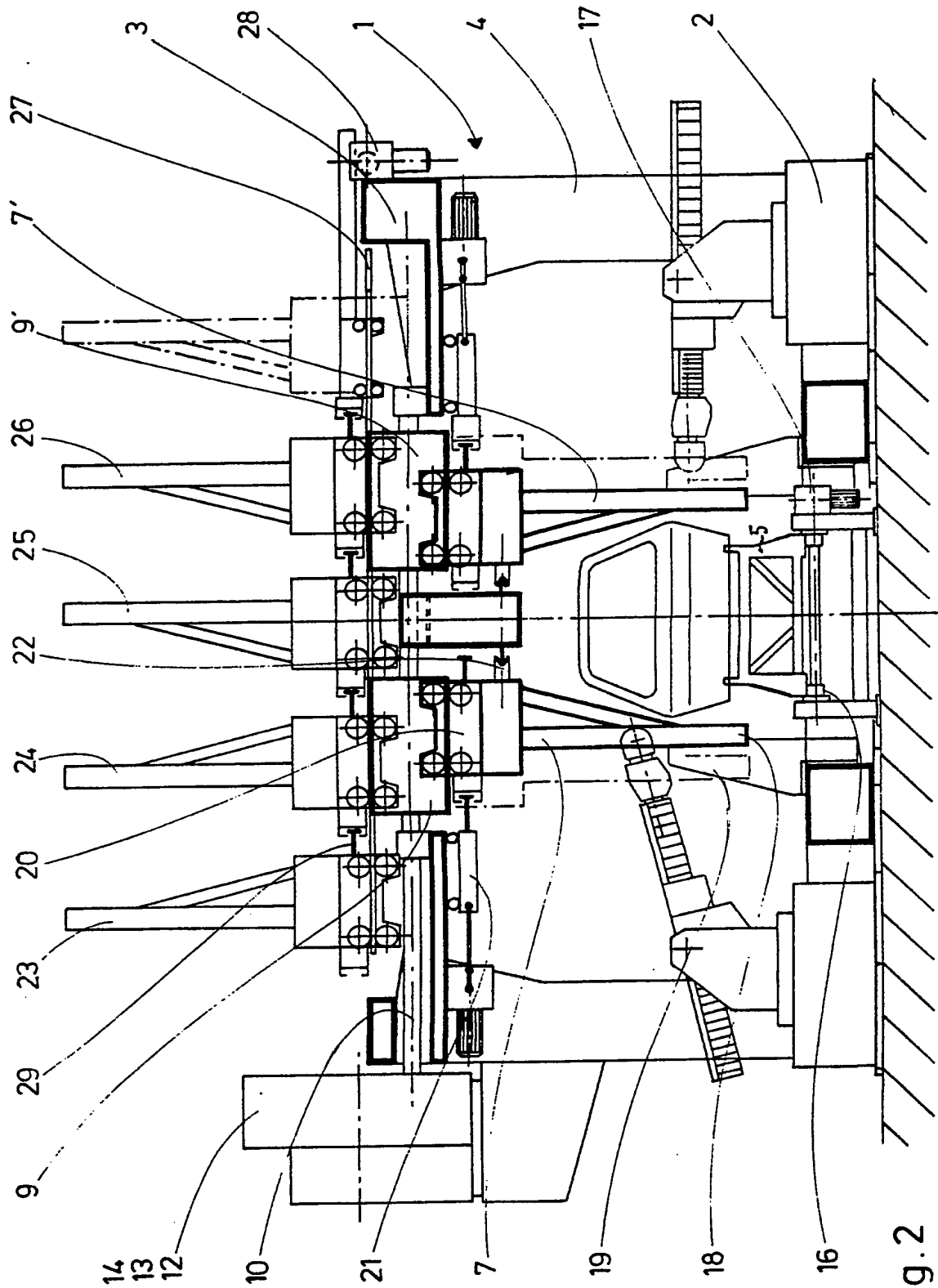


Fig. 2

"Machine for assembling motor vehicle or similar
bodies"

The invention relates to a machine for assembling motor vehicle or similar bodies.

Where certain methods of construction are concerned, it is generally envisaged to produce various alternative forms of one and the same model or a plurality of models of vehicle from sub-assemblies such as the floor, the side panels, the roof, the front and rear parts. In such a case, the quantities of each of the alternatives or of each of the models may vary within wide limits and the manufacturing facilities must be able to adapt rapidly to any of them when there is a change in production. When the said means are set up with a view to speed, it can be envisaged that those parts of the plant which are used for the finishing operations have to be able to adapt instantly to the alternative or model which occurs at random on the assembly line.

There do already exist solutions to this type of problem. These solutions reside in providing a machine having several interchangeable tools the purpose of which is to ensure strictly accurate positioning of the sub-assemblies constituting the alternative or model in question and then tack welding these sub-assemblies and then carrying out the finishing stages, off the machine, on a robot-manned or other line, the characteristic features of which are likewise that they rapidly adapt to the said alternative or the said model.

For questions of simplicity, the interchangeable tools on the positioning and tack welding machine are disposed parallel with the general axis of the machine, an axis parallel with the transfer of vehicle bodies to be assembled. This arrangement employs suitable rails on which the tools slide and, during the working phase, take up their position on the inside of the machine.

The most frequent arrangement could be described as follows:

- the sub-assemblies of the bodywork to be made up are roughly preassembled by any means and are supported by a trolley which transports them from station to station,

- the trolley is locked rigidly on the machine. The trolley corresponds to the model transported,

- during this time the specific tools corresponding to the side panels, roofs, etc., are automatically brought forward on suitable guide means, the said tools likewise being locked rigidly on the machine.

When this type of machine, as is generally the case, has to assemble in some random sequence three alternative forms or three models of bodywork, the length of the machine must be such that it is capable of receiving three tools for side panels or roofs which, according to circumstances (because they are sliding on the same rails) have to be situated so that two of them are on the downstream side or on the upstream side in the direction of parts movement.

This is why such prior art machines have the disadvantage of occupying quite a considerable surface area, so necessitating excessive investment and running costs.

The object of the present invention is to offset these aforesaid drawbacks in that it consists of an arrangement of elements and tools such as will satisfy all the requirements mentioned hereinabove and imposed by the random production of a plurality of alternative forms or models of vehicles while at the same time having an overall bulk which is reduced solely to that of the basic machine without encroaching on the other parts upstream and downstream in the line.

More particularly, the invention relates to a system which permits of interchangeability of the lateral tools on one station for assembling a plurality of alternative forms or models of bodywork in a simple, precise and not bulky way.

More particularly, the system which is the object of the invention embraces a means of storing those tools which are not being used and which does not affect the overall upstream or downstream bulk as in known systems, which means that it consequently offers a substantial advantage.

To this end, the machine according to the invention is characterised in that it comprises means of storing tools relative to different models of bodywork, at least one support which is pivotally mounted on a pivot and which is adapted to receive (in two angularly offset positions) at least two tools for two different models of bodywork, operating means for pivoting the support and for placing one of the tools in a working position while the other is in a standby position, means which, in the standby position of the support, provide for transfer of one of the tools situated on the storage means to the support and the transfer of the tool situated on the support to the storage means.

According to another characteristic feature of the invention, the pivot has a horizontal axis crosswise to the axis of the machine.

According to another characteristic feature of the invention, the storage means consist of rails.

According to another characteristic feature of the invention, the rails are parallel with the pivot.

According to another characteristic feature of the invention, the tools are mounted for movement on the pivoting support so that they can be placed in a cleared position when the support is in the working position or in a position in which they engage a vehicle body.

By way of non-limitative example, the invention is illustrated in the accompanying drawings, in which:

Fig. 1 is a profile view showing in particular the rotating mechanism which makes it possible to bring a tool from a standby position to a working position;

Fig. 2 is a front view which shows in particular the transfer mechanism for moving a tool from a storage position to the standby position.

Fig. 1 shows the machine which comprises a frame 1 consisting of a bottom base 2 and a top plate 3 connected to each other by the four columns 4.

In the bottom part, a support 5 adapted for movement

in the axis of the machine towards the right of the drawing supports a preassembled vehicle body 6.

When the preassembled vehicle body 6 is in the position such as is shown in the drawing, the support 5 is locked and the lateral shaping tool 7 is in position.

For this, the said tool 7 is mounted on transverse slides 8 on a support 9.

The support 9 is mounted on the pivot 10 parallel with the slides 8.

On the face of the support 9 which is opposite that comprising the tool 7 there is mounted in identical fashion, in a standby position, another tool 11 corresponding to a different model of vehicle, not shown in the drawing, or to an alternative form of the model 6.

Pivoting of the support 9 about the pivot 10 is controlled by a suitable device. In the particular case shown, this device consists of a rack 12 acting on a pinion (not shown) rigid with the support 9 and caused to perform a translatory movement by the jack 13 and the step-up assembly 14.

Of course, the other side of the machine comprises a symmetrically disposed system.

By pivoting the support 9 through 180° on the pivot 10 it will be appreciated that either the tool 7 or the tool 11 can be used, according to the vehicle which is to be produced. The line 15 shows the deflection generated by this operation.

Fig. 2 shows the same machine in a profile view (the axis of the machine being at right-angles to the drawing), in which one can see the previously mentioned elements, viz.: the frame elements 1, 2, 3 and 4, the trolley 5 and its rolling track equipped with the motor 17, the support 9 and its symmetrical counterpart 9' adapted to rotate about the single transverse pivot 10 which is utilised by the mechanism 12, 13, 14.

This same drawing likewise shows the tool 7 and its symmetrical counterpart 7' in the working position.

In the working position, these tools can each assume two positions. For the tool 7, these positions correspond to

the position 18 of engagement with the bodywork 7 and the position 19 represents the cleared position which permits displacement of the trolley 5 for the positioning of a new body, the tool then returning to the engaged position if this body is of the same model as the previous one.

The change of position is performed by displacement of the tool support 20 which slides on slides 8 of the support 9 under the action of the jack 21.

When the tool 7 is in the engaged position 18, it is referenced mechanically by means 22.

In the upper part, it can be seen that four tools are provided, the tools 23 and 24 for the right-hand side of a body and the tools 25 and 26 for the left-hand side.

The tools 24 and 26 which are in the standby position on the supports 9, 9' are automatically hooked up with the tools 23 and 25 in the storage position so that they can be moved simultaneously on the rails 27 and the slides 8 by operation of the motorised reduction unit 28.

The tools 7 and 7' on the one hand, 24 and 26 on the other and 23 and 25 finally each correspond to one model of body or an alternative body.

While the tools 7 and 7' are working, there is every facility for transferring tools by operation of the motor reduction unit 28 connected to the various supports which are hooked up to one another, which may be required in the subsequent cycle, and then a rotation through 180° is sufficient to effect the change-over.

For their translatory movement, the tools are mounted on roller supports 20 and are guided by rails 27 and slides 8.

In such a machine, no description is given of the welding means as any such means may be used: arc welding, resistance welding, laser welding, gluing. Only programmable robots are shown.

Any other practical arrangement of the essential assemblies will not affect the invention as described on a basis of one particular but not restrictive embodiment. Furthermore, the number of tools may exceed that envisaged in

the drawings, according to the particular needs which the installation has to satisfy.

Furthermore, the system of rotation and storage may, without departing from the scope of the invention, be adapted to suit any part or assembly comprising a plurality of alternatives or models, of which the order of production is random.

CLAIMS

1. A machine for assembling motor vehicle or similar bodies, comprising storage means for storing tools relative to different models of bodywork, at least one support which is pivotally mounted on a pivot and which
5 is adapted in angularly off-set positions to receive at least two tools for at least two different models of bodywork, operating means for pivoting the support and for placing one of the tools in a working position while the other is in a standby position, means whereby,
10 in the standby position of the support, one of the tools situated on the storage means can be moved towards the support while the tool situated on the support is moved towards the storage means.
2. A machine according to claim 1, wherein the pivot
15 has a horizontal axis crosswise to the axis of the machine.
3. A machine according to claim 1, wherein the storage means comprise rails.
4. A machine according to claims 1 to 3, wherein the rails are parallel with the pivot.
- 20 5. A machine according to any preceding claim, wherein the tools are movably mounted on the pivoting support so that when the support is in the working position, they can be placed in a cleared position or into a position in which they engage a vehicle body.
- 25 6. A machine according to claim 5, wherein the rails of the storage means are disposed in such a way as to provide

for transfer of the tools from the storage position on rails to the standby position on the slides, operating means being provided to move the tool which is in the working position between the engaged and cleared positions.

5 7. A machine according to any preceding claim, wherein the supports are provided with hooking means for hooking-up the tool in a standby position on the support, with at least one tool which is in the stored position on the rails.

8. A machine according to any preceding claim, wherein
10 the support comprises two tools and the operating means provide for this support to be pivoted through 180° between the standby position and the working position.

9. A machine for assembling motor vehicle on similar bodies, the machine being constructed and arranged
15 substantially as herein described.

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